

Quantum®



DLT VS80

Tape Drive Installation and Operations Guide



Copyright

Copyright © 2004 by Quantum Corporation. All rights reserved.
Document Origination: Boulder, Colorado, USA.

Trademarks

Quantum, the Quantum logo, and the DLTtape logo are trademarks of Quantum Corporation, registered in the U.S.A. and other countries. DLTtape, DLTSage, Value DLTtape, and Super DLTtape are trademarks of Quantum Corporation.

Other company and product names used in this document are trademarks, registered trademarks, or service marks of their respective owners.

Legal Disclaimers

The information contained in this document is the exclusive property of Quantum Corporation. Quantum retains its copyright on the information contained herein in all cases and situations of usage, including derivative works. The possessor agrees to safeguard this information and to maintain it in confidence and not re-publish it in whole or in part without Quantum's prior written consent.

Quantum reserves the right to make changes and improvements to its products, without incurring any obligation to incorporate such changes or improvements in units previously sold or shipped.

Contact Information

You can request Quantum publications from your Quantum Sales Representative or order them directly from Quantum.

Telephone numbers and street addresses change frequently; for the latest, up-to-date contact information, visit

www.quantum.com

The *Contact Us* section of the web site lists telephone numbers, street addresses, time zones, and other pertinent facts.

Revision History

The following table lists all revisions made to this document.

Document Release	Date	Summary of Changes
001596-01 Rev 01	February 2, 2001	Initial preliminary release
001596-01 Rev 02	February 6, 2001	Updated LED sequence
001596-01 Rev 03	February 16, 2001	Updated external SCSI ID setting
001596-01 Rev 04	April 5, 2001	Updated logo and product name
001596-01 Rev 05	May 4, 2001	Edits per Jeff Faucet
001596-01 Rev 06	July 20, 2001	Updated internal unit mounting to include screw length
001596-01 Rev A07	May 12, 2004	Converted to FrameMaker, using the Quantum template and style guide per ECO C009631

Notes



Table of Contents

1 Introduction	1-1
Purpose and Scope	1-1
Related Documents	1-1
Structure of this Manual	1-1
Conventions Used in this Manual	1-2
For More Information	1-2
Reader Comments	1-2
2 Product Information	2-1
DLT VS80 Tape Drive Overview	2-1
DLT VS80 Tape Drive Features	2-1
Data Transfer Rate	2-1
Capacity	2-2
Data Compression	2-2
Media	2-2
Compatibility	2-2
Firmware Update Capability	2-2
Embedded Diagnostics	2-2
3 DLT VS80 Installation	3-1
Preparing to Install Your Tape Drive	3-1
SCSI Requirements	3-1
Before You Begin	3-2
Installing Your Tabletop Tape Drive	3-2
Unpacking Your Tabletop Tape Drive and Selecting a Location	3-2
Unpacking Your Tabletop Tape Drive	3-2
Selecting a Location for Your Tabletop Tape Drive	3-3

Setting the SCSI ID	3-4
Connecting the Cables	3-5
Terminating Your Tabletop Tape Drive	3-8
Powering the Terminator	3-8
Completing the Installation	3-9
Installing Your Internal Tape Drive	3-10
Unpacking Your Internal Tape Drive	3-10
Configuring Your Internal Tape Drive	3-11
Setting the SCSI ID	3-11
Terminating Your Internal Tape Drive	3-12
Installing Your Internal Tape Drive	3-13
Testing Your Tape Drive	3-18
Troubleshooting Your Tape Drive	3-19
General Troubleshooting Guidelines	3-19
Troubleshooting the Tape Drive	3-19

4 DLT VS80 Use 4-1

Front Panel Controls and Indicators	4-1
Indicator Activity During Power-On Self-Test (POST)	4-2
Indicator Activity During Tape Drive Operation	4-2
Data Cartridge Use and Care	4-4
Loading a Data Cartridge	4-4
Unloading a Data Cartridge	4-5
Write-Protecting Data Cartridges	4-6
Caring for Your Data Cartridges	4-7
Using the Cleaning Cartridge	4-8

5 DLT VS80 Firmware 5-1

Updating Tape Drive Firmware—Overview	5-1
Creating a Firmware Update Data Cartridge	5-2
Updating the Firmware	5-2
Updating the Firmware	5-2
Troubleshooting the Firmware Upgrade	5-4



List of Figures

3 DLT VS80 Installation	3-1
Figure 3-1. Tabletop Tape Drive Rear Panel Layout	3-4
Figure 3-2. SCSI ID Selector Switch	3-5
Figure 3-3. Tape Drive SCSI and Power Cable Connections	3-6
Figure 3-4. Workstation SCSI Cable Connections	3-7
Figure 3-5. Back Panel Connections, Tabletop Tape Drive	3-8
Figure 3-6. Back Panel Connections, Internal Tape Drive	3-11
Figure 3-7. Terminator Installation	3-12
Figure 3-8. SCSI Cable with Built-in Terminator	3-13
Figure 3-9. Remove the Workstation Cover (example shown)	3-14
Figure 3-10. Tape Drive Installation in an Open Drive Bay	3-15
Figure 3-11. SCSI and Power Cable Location (Internal Tape Drive)	3-16
Figure 3-12. Securing the Internal Tape Drive in the Installation Bay	3-17
4 DLT VS80 Use	4-1
Figure 4-1. Tabletop Tape Drive Front Panel Layout	4-1
Figure 4-2. Loading a DLTtape IV Data Cartridge	4-4
Figure 4-3. Unloading a DLTtape IV Data Cartridge	4-5
Figure 4-4. Data Cartridge Write-Protect Switch	4-6
Figure 4-5. DLT Cleaning Cartridge	4-8

Notes



List of Tables

3 DLT VS80 Installation	3-1
Table 3-1. Selecting the SCSI ID.	3-11
Table 3-2. Understanding Errors Indicated by Front Panel LEDs.	3-20
4 DLT VS80 Use	4-1
Table 4-1. Tape Drive Status and Indicator Activity	4-2
Table 4-2. Indicator Activity	4-3
5 DLT VS80 Firmware	5-1
Table 5-1. Firmware Upgrade Troubleshooting	5-4

Notes



CHAPTER 1

Introduction

1.1 Purpose and Scope

This Installation and Operations Guide is a comprehensive source of information about the DLT VS80 tape drive (internal and tabletop).

This manual provides all the information you need to install and use your internal tape drive or tabletop tape drive.

1.2 Related Documents

DLT VS80 Tape Drive Product Specification (001597-01)

DLT1/VS80 SCSI Interface Guide (000825-01)

1.3 Structure of this Manual

- [Chapter 1, “Introduction,”](#) is the chapter you are currently reading.
- [Chapter 2, “Product Information,”](#) provides a general overview of the product.
- [Chapter 3, “DLT VS80 Installation,”](#) explains how to configure and install your tabletop or internal tape drive.
- [Chapter 4, “DLT VS80 Use,”](#) explains how to use your tape drive.
- [Chapter 5, “DLT VS80 Firmware,”](#) explains how to update your tape drive’s firmware.

1.4 Conventions Used in this Manual

This manual uses the following conventions:

NOTE: *Notes* provide supplemental information.

CAUTION *Cautions* provide information you must know to avoid damaging the tape drive or losing data.

1.5 For More Information

The web site www.quantum.com includes valuable information about all Quantum products; or for personalized information about Quantum's reliable data protection products, call **1-800-624-5545** in the U.S.A. and Canada.

1.6 Reader Comments

Quantum is committed to providing the best products and service. We encourage your comments, suggestions, and corrections for this manual. Please send all comments to this address:

Quantum Technical Publications
4001 Discovery Dr.
Suite 120
Boulder, Colorado USA 80303



Product Information

This chapter introduces the DLT VS80 tape drive and provides a general overview of the product.

2.1 DLT VS80 Tape Drive Overview

Your Quantum DLT VS80 tape drive is a value-priced, high-reliability, high-capacity linear streaming data cartridge tape drive designed for use on entry- to mid-range computing platforms. With a combination of data compression and compaction, your DLT VS80 tape drive offers a data cartridge capacity of 80 gigabytes (GB) (assuming a 2:1 compression ratio), and a sustained user data transfer rate of 6 megabytes (MB) per second (assuming a 2:1 compression ratio).

The DLT VS80 tape drive is a 5¼-inch, half-height form-factor device that uses ½-inch tape. Its design includes a dual channel read/write head, Lempel-Ziv (DLZ) high-efficiency data compression, and a tape-mark directory to achieve fast data throughput and data access times.

2.2 DLT VS80 Tape Drive Features

2.2.1 *Data Transfer Rate*

The tape drive's native (uncompressed) data transfer rate is 3.0 MB per second. With 2:1 data compression, the data transfer rate increases to as much as 6.0 MB per second.

2.2.2 Capacity

The tape drive uses DLTtape™ IV data cartridges, which offer 40 GB of native data storage or up to 80 GB of compressed data storage.

The capacity you realize in practice depends on the data set.

2.2.3 Data Compression

The tape drive includes a data compression feature that helps it store data efficiently. A read/write buffer of up to 2 MB provides working space for the compression feature, allowing you to get the most out of the available media space.

2.2.4 Media

The DLTtape IV media is designed to endure 1,000,000 passes and has a shelf life of 30 years, providing superior media durability and data reliability.

2.2.5 Compatibility

The tape drive is read-compatible with the DLT4000 tape drive format using DLTtape IV data cartridges.

For current information on operating system, application, and tape driver compatibility, visit www.quantum.com

2.2.6 Firmware Update Capability

The DLT VS80 includes Flash EEPROM technology so you can make on-site firmware updates from tape or the Small Computer System Interface (SCSI) bus.

2.2.7 Embedded Diagnostics

The DLT VS80 has embedded diagnostic software that indicates diagnostic results and tape drive operating status, and it tells you when you need to clean the tape drive. The tape drive also has embedded error logging to help you diagnose any reported problems.



DLT VS80 Installation

This chapter explains how to configure and install your tabletop or internal tape drive. Follow the steps and instructions presented in this chapter to install and configure your tape drive.

3.1 Preparing to Install Your Tape Drive

This section helps you prepare to install your tabletop tape drive or internal tape drive.

3.1.1 *SCSI Requirements*

Your DLT VS80 tape drive (tabletop and internal) incorporates a wide Ultra SCSI-2 SCSI bus, but you can also attach it to a single-ended (SE) or low-voltage differential (LVD) SCSI bus.

Make sure your SCSI host bus adapter or controller supports these configurations. If you connect the tape drive to an SE bus, or if there are SE devices attached to the same SCSI bus, the tape drive's performance is limited to the maximum data transfer speed and maximum cable lengths of the SE bus (usually 40 MB/s).

NOTE: The DLT VS80 is not compatible with a standard differential or high-voltage differential (HVD) SCSI bus.

3.1.2 Before You Begin

Installing your DLT VS80 tabletop tape drive requires no special tools. You will need a ballpoint pen to change the SCSI ID switch on the rear panel of the tape drive.

If you are installing a DLT VS80 internal tape drive, refer to [“Installing Your Internal Tape Drive” on page 3-10](#) for instructions. Installing your DLT VS80 internal tape drive requires the tools needed to install an internal tape drive in the computer you have chosen to house the tape drive (for example, a screwdriver and some ESD protection).

3.2 Installing Your Tabletop Tape Drive

This section contains step-by-step instructions for installing your DLT VS80 tabletop tape drive. Be sure to read through this entire section before beginning the installation.

3.2.1 Unpacking Your Tabletop Tape Drive and Selecting a Location

Before you begin, clear a desk or table so that you can unpack your tabletop tape drive. You also need to select a location near the server or workstation that is to host your tape drive.

NOTE: If the room in which you are working differs from the temperature at which the tabletop tape drive was shipped or stored by 30 °F (15 °C) or more, let the tape drive acclimate to the surrounding environment for at least 12 hours before opening the shipping carton.

Unpacking Your Tabletop Tape Drive

The first step is to unpack and inspect your tabletop tape drive for shipping damage, following these steps:

1. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
2. Open the shipping box and remove the accessories package. Open the accessories package so that the accessories are handy during installation.

3. With the tape drive still in the shipping box, reach under and around the tape drive, carefully lift it out of the shipping box, and place it on the work surface, top facing up. Do not stand the tape drive on either end.
4. Carefully remove the tape drive from the protective bag.

NOTE: Save the packing materials in case you need to move or ship your tape drive in the future. You must ship your tabletop tape drive in the original or equivalent packing materials to preserve your warranty.

Selecting a Location for Your Tabletop Tape Drive

Select a location for your tape drive that is flat, sturdy, level, and close to the server or workstation. A desk or tabletop surface is most suitable. Regardless of the location you choose, make sure the environment is free from dust, cigarette smoke, and excessive temperature and humidity. See the *DLT VS80 Tape Drive Product Specification* for acceptable operating temperature and humidity limits.

Be sure to follow these additional guidelines when selecting a location for your tape drive:

- Allow at least 6 inches (15.2 cm) behind the tape drive for proper cooling.
- Avoid locations near printers or photocopy machines, both of which produce paper fiber and other types of dust and airborne contaminants.
- Do not place your tape drive on the floor.

CAUTION Avoid locations near generators, electric motors, audio speakers, or other sources of magnetic fields. Magnetic fields can adversely affect your tape drive and data cartridges.

3.2.2 Setting the SCSI ID

All SCSI devices attached to the server or workstation must have a unique SCSI ID. Check the SCSI IDs on all other devices on the selected server or workstation, including the SCSI host bus adapter, and select an unused SCSI ID for your tape drive. The factory default SCSI ID for this tape drive is 5, as shown in [Figure 3-1](#). If the tape drive's factory default SCSI ID is not already in use by another device on the same SCSI bus, you do not need to change the SCSI ID.

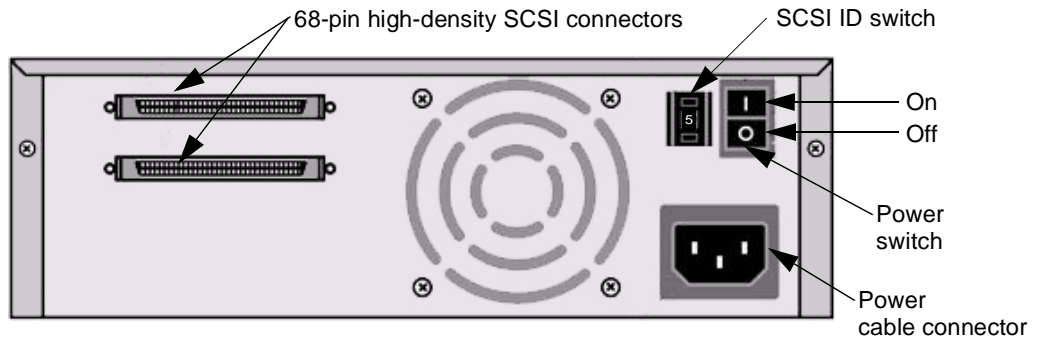


Figure 3-1. Tabletop Tape Drive Rear Panel Layout

NOTE: If the tabletop tape drive is attached to a narrow SCSI bus, only IDs 0 through 7 are valid. If it is a wide SCSI bus, then you can use IDs 0 through 15.

To set the SCSI ID on the tabletop tape drive, use a small screwdriver or ballpoint pen to press the button above the SCSI ID display to select the next lower SCSI ID. Press the button below the SCSI ID display to select the next higher SCSI ID. Each time you press one of these buttons, the SCSI ID decreases or increases by one. Press the appropriate button until the desired SCSI ID appears on the switch display.

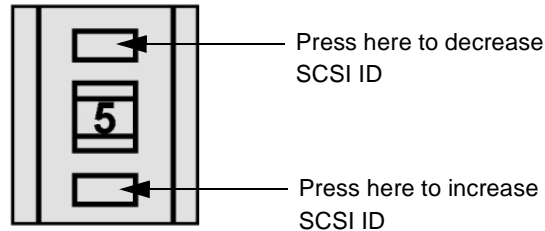


Figure 3-2. SCSI ID Selector Switch

NOTE: If the tape drive is powered on when you change the SCSI ID, you must power the tape drive off and on again for the new SCSI ID to take effect.

3.2.3 Connecting the Cables

Follow these steps to connect the SCSI and power cables to your tape drive:

NOTE: If the selected server or workstation does not already have an installed SCSI host bus adapter, you will need to install one. For more information on SCSI host bus adapter requirements, see [“SCSI Requirements” on page 3-1](#).

1. Shut down the operating system and power down the server or workstation.
2. Power off all attached peripheral devices, such as printers and other SCSI devices.

CAUTION Do not go to step 3 until you have completed steps 1 and 2. Failure to follow these instructions may result in damage to your tape drive or other devices.

3. Select a SCSI cable with an open 68-pin, high-density connector.

4. Connect one end of the SCSI cable to one of the connectors on the rear panel of your tape drive, as shown in [Figure 3-3](#). Either SCSI connector works equally well.

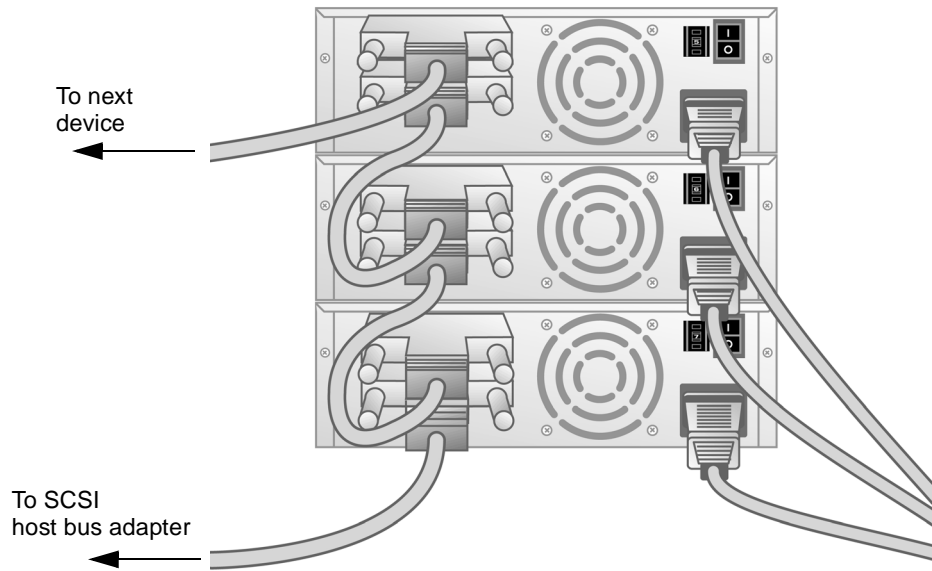


Figure 3-3. Tape Drive SCSI and Power Cable Connections

NOTE: [Figure 3-3](#) does not show a terminator because none of the three tape drives in the illustration are at the end of the SCSI bus.

5. Connect the other end of the SCSI cable to the connector on your SCSI host bus adapter, as shown in [Figure 3-4](#) or to the connector on the previous SCSI device on the SCSI bus.

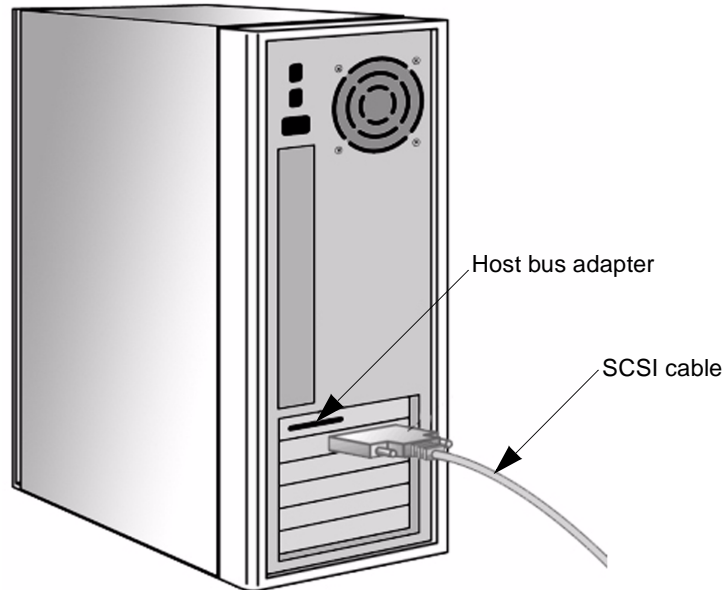


Figure 3-4. Workstation SCSI Cable Connections

NOTE: If the SCSI cable does not fit the connector on the SCSI host bus adapter, you either have an incompatible SCSI host bus adapter or you need to purchase a cable adapter. Contact Quantum Corporation or your SCSI host bus adapter manufacturer for information.

Terminating Your Tabletop Tape Drive

You must terminate the tape drive if it is the last physical device on the SCSI bus (at the end of the SCSI chain). If another SCSI device is the last device on the SCSI bus, confirm that it is properly terminated and do *not* terminate your tape drive.

NOTE: Regardless of which device terminates the SCSI bus, it must have power applied and be powered on for proper termination to occur.

To terminate your tape drive, press the terminator firmly into either of the two SCSI connectors on the rear panel of the tape drive. Secure it by tightening the screws until snug. See [Figure 3-5](#) for more information.

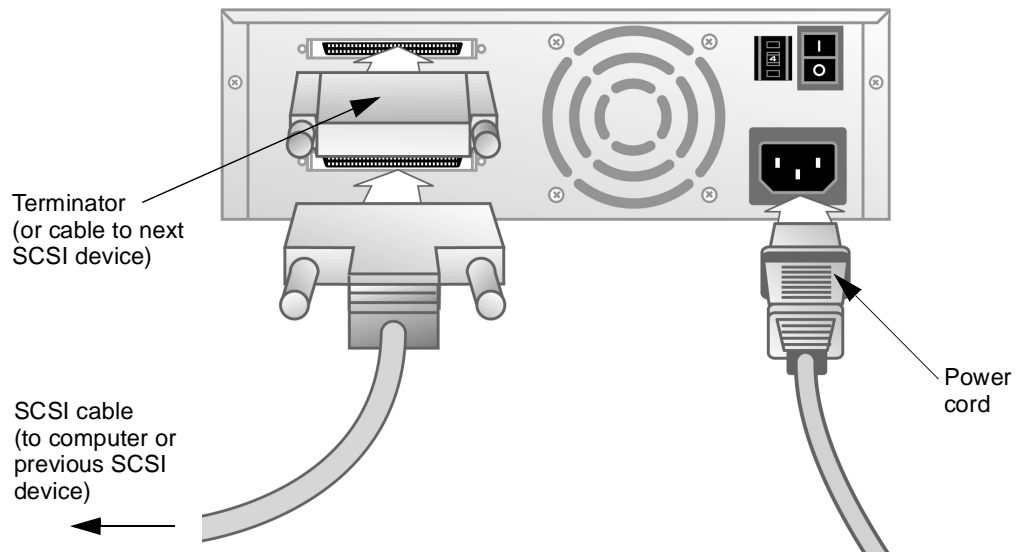


Figure 3-5. Back Panel Connections, Tabletop Tape Drive

Powering the Terminator

At least one device on the SCSI bus must supply terminator power (TERMPWR). The factory default for the tape drive is for TERMPWR to be enabled. Only an authorized service provider can disable the tape drive TERMPWR setting.

NOTE: It is acceptable for more than one device on the SCSI bus to provide TERMPWR

3.2.4 *Completing the Installation*

1. Secure all the SCSI cable connectors by tightening their screws until snug.
2. Make sure the power switch on the rear panel of the tabletop tape drive is in the OFF position. See [Figure 3-1](#) for reference.
3. Attach the female connector on the power cable to the power connector on the rear panel of the tape drive.
4. Plug in the power cable to a nearby power outlet.
5. Attach the power cables to the host server or workstation and all attached devices.
6. Power on the tabletop tape drive and any other devices you powered off earlier.
7. Power on the host server or workstation and allow its operating system to start.
8. Check your tape drive to make sure it is working properly. See [“Testing Your Tape Drive” on page 3-18](#) to learn about the tabletop tape drive’s POST and initialization features.

3.3 Installing Your Internal Tape Drive

This section contains step-by-step instructions for installing your DLT VS80 internal tape drive. Be sure to read through the entire section before beginning the installation.

3.3.1 *Unpacking Your Internal Tape Drive*

First, clear a desk or table so that you can unpack your tape drive.

NOTE: If the room in which you are working differs from the temperature in which the tape drive was shipped or stored by 30 °F (15 °C) or more, let the tape drive acclimate to the surrounding environment for at least 12 hours before opening the shipping carton.

The first step is to unpack and inspect the tape drive for shipping damage. To do a thorough job, follow these steps:

1. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
2. Open the shipping box and remove the accessories.
3. With the tape drive still in the shipping box, reach under and around the tape drive, carefully lift it out of the shipping box, and place it on the work surface, top facing up. Do not stand the tape drive on either end.
4. Carefully remove the tape drive from the protective bag.

NOTE: Save the packing materials in case you need to move or ship your tape drive in the future. You must ship your tape drive in the original or equivalent packing materials to preserve your warranty.

If there is no damage to the tape drive, select a server or workstation to host your tape drive, then move on to the following installation steps.

3.3.2 Configuring Your Internal Tape Drive

The following sections explain how to configure your internal tape drive.

Setting the SCSI ID

All SCSI devices that are attached to the server or workstation must have a unique SCSI ID. Check the SCSI IDs on all other devices on the selected server or workstation, including the SCSI host bus adapter, and select an unused SCSI ID for your tape drive. The factory default SCSI ID is 5drive's factory default SCSI ID is not being used, you do not need to change the SCSI ID.

NOTE: If the tape drive is attached to a narrow SCSI bus, you can only use IDs 0 through 7. If it is a wide SCSI bus, then you can use IDs 0 through 15.

1. Locate the SCSI ID jumpers on the rear panel of the tape drive as shown in [Figure 3-6](#).

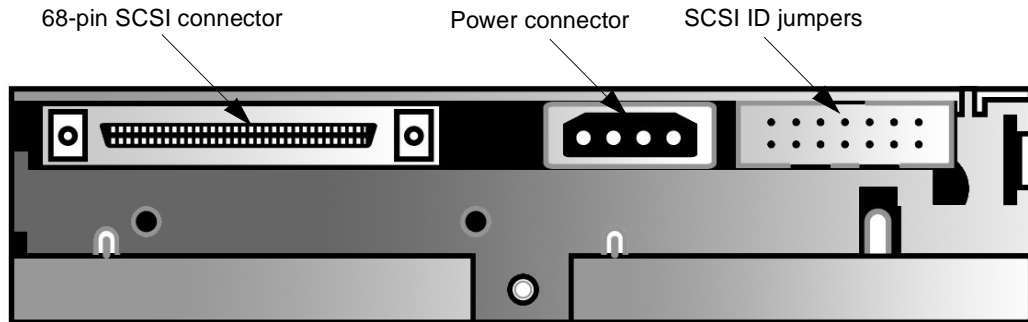


Figure 3-6. Back Panel Connections, Internal Tape Drive

2. Use the supplied jumpers to set the desired SCSI ID, as shown in the following table:

Table 3-1. Selecting the SCSI ID

SCSI ID	0	1	2	3	4	5 ^a	6	7
Jumper Block								
SCSI ID	8	9	10	11	12	13	14	15
Jumper Block								

a. Factory default SCSI ID

Terminating Your Internal Tape Drive

You must terminate the tape drive if:

- It is the only SCSI device—other than the SCSI host bus adapter—on the selected server or workstation’s SCSI bus.
- It is the last SCSI device on the selected server or workstation’s SCSI bus.

To terminate the tape drive, insert an active low-voltage differential (LVD) or multimode LVD/SE terminator into the connector on one end of the SCSI ribbon cable as shown in [Figure 3-7](#). You can use a cable-end terminator as shown in [Figure 3-7](#) or an inline terminator, whichever is most convenient. Continue with the rest of the installation as usual.

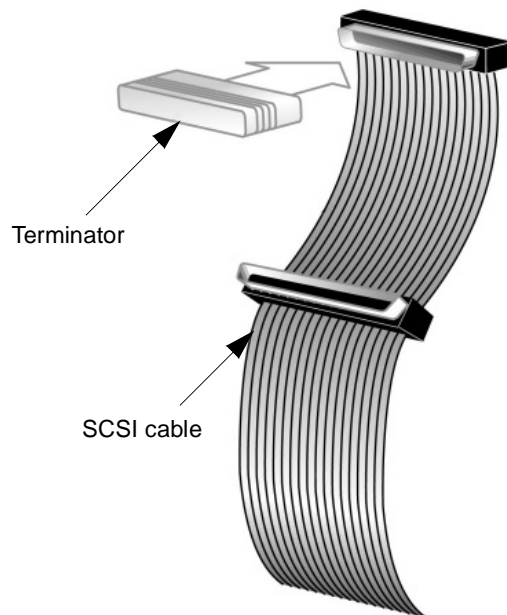


Figure 3-7. Terminator Installation

NOTE: If the SCSI cable that came with the SCSI host bus adapter already has a terminator built into it, do not use another terminator. An example of such a cable is shown in [Figure 3-8](#).

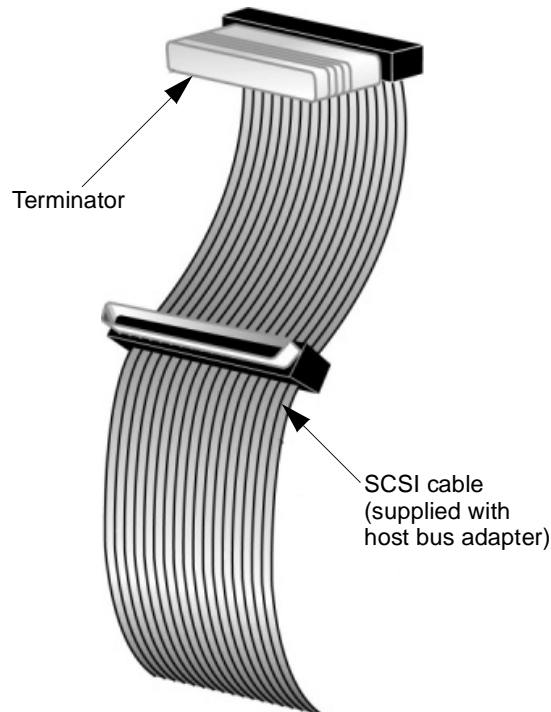


Figure 3-8. SCSI Cable with Built-in Terminator

3.3.3 Installing Your Internal Tape Drive

In the final installation stages, you install your tape drive in the server or workstation and connect the SCSI and power cables.

To install your internal tape drive, follow these steps:

1. Shut down the operating system and power off the selected server or workstation.
2. Power off all peripheral devices such as printers and other SCSI devices.

CAUTION Do not go to step 3 until you have completed steps 1 and 2. Failure to follow these instructions may result in damage to the tape drive or other devices.

3. Remove the cover from the server or workstation as described in the server's or workstation's manuals. See [Figure 3-9](#) as an example.

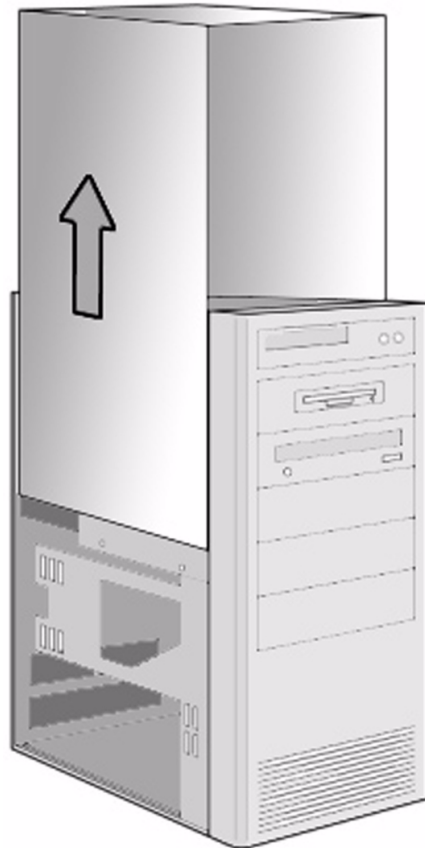


Figure 3-9. Remove the Workstation Cover (example shown)

4. Locate an available 5¼-inch drive bay and remove the front cover from the drive bay as described in the server or workstation's manuals.

5. Slide your tape drive into the open drive bay as shown in [Figure 3-10](#).

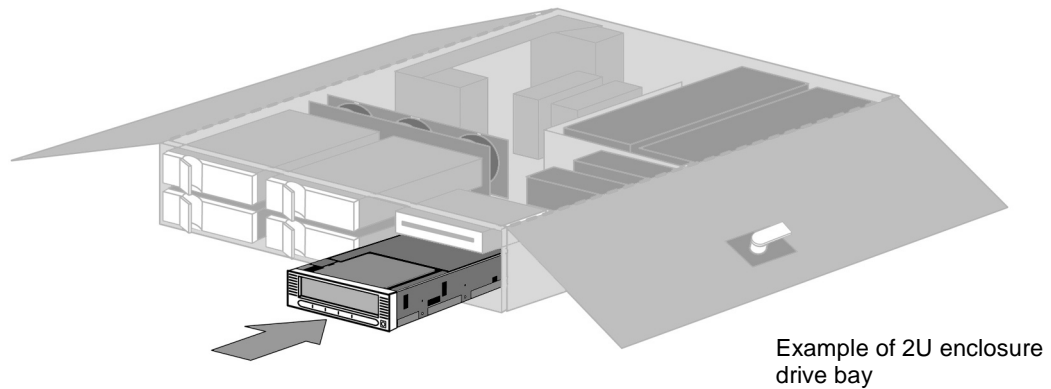
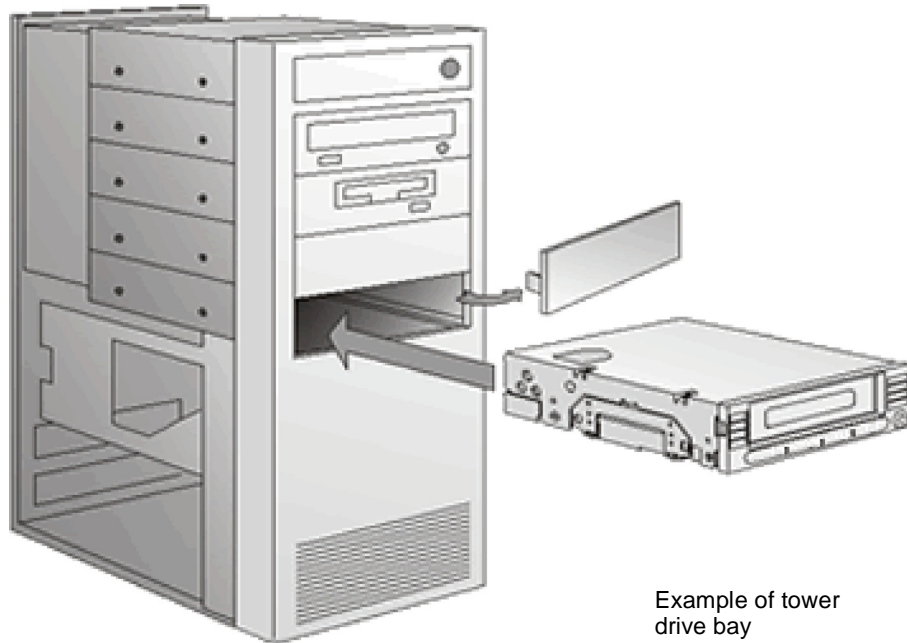


Figure 3-10. Tape Drive Installation in an Open Drive Bay

NOTE: Install an LVD/SE SCSI host bus adapter in the selected server or workstation now, if necessary. For more information on SCSI host bus adapter requirements, see [“SCSI Requirements” on page 3-1](#).

6. Select a SCSI cable with an open 68-pin, high-density connector.
7. Connect one end of the SCSI cable to the SCSI connector on the rear panel of your tape drive. The SCSI connectors are keyed, preventing improper connection.

NOTES: 1 If the SCSI cable does not fit the connector on your SCSI host bus adapter, you either have an incompatible SCSI host bus adapter or you need to purchase a cable adapter. Contact your Quantum sales representative or your SCSI host bus adapter manufacturer for information.

2 Refer to [“Terminating Your Internal Tape Drive” on page 3-12](#) to determine if you need to host bus adapter use an LVD/SE terminator with the SCSI cable.

8. Connect the other end of the SCSI cable to the SCSI host bus adapter, aligning the colored stripe on the ribbon cable with pin 1 on the SCSI host bus adapter’s connector.
9. Locate an available power cable in the host server or workstation and attach it to the power connector on the rear panel of the tape drive. The connectors are keyed, preventing improper connection.

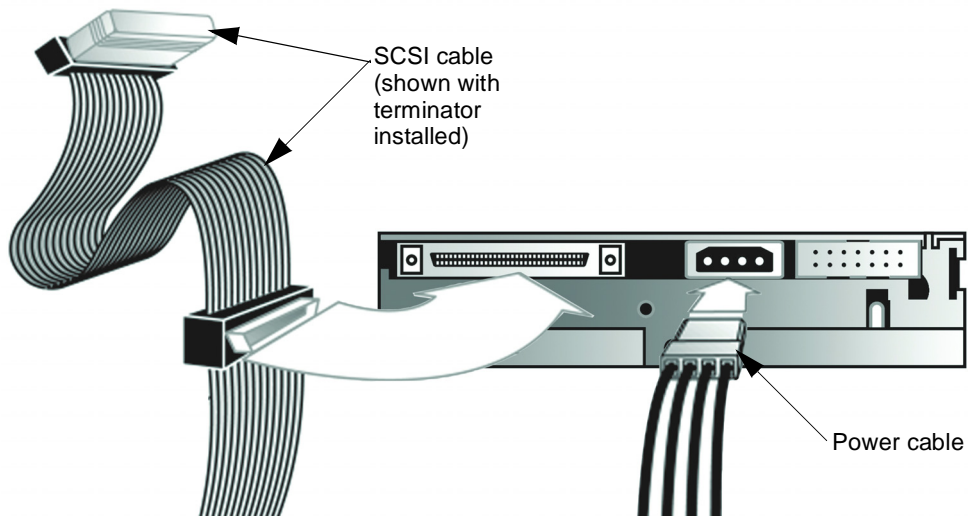


Figure 3-11. SCSI and Power Cable Location (Internal Tape Drive)

10. Secure the tape drive with the mounting screws provided, either in the sides or bottom of the tape drive sled, as appropriate for the server or workstation chassis. See [Figure 3-12](#).

CAUTION Using a screw that is too short can result in inadequate clamping force. Using a screw that is too long can cause damage to the internal circuit cards. Please see the note following [Figure 3-12](#) for guidance.

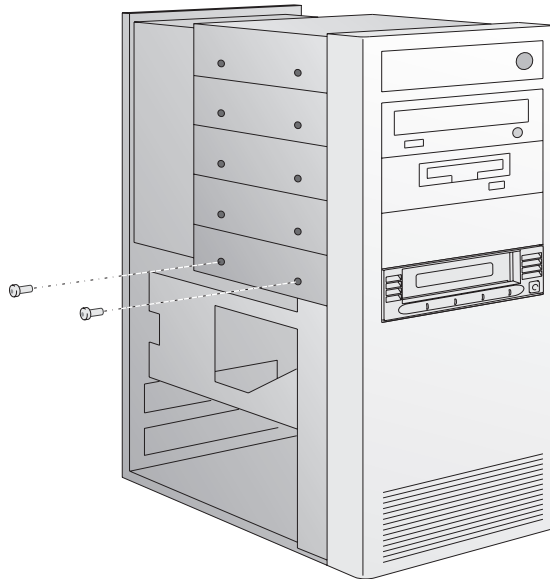
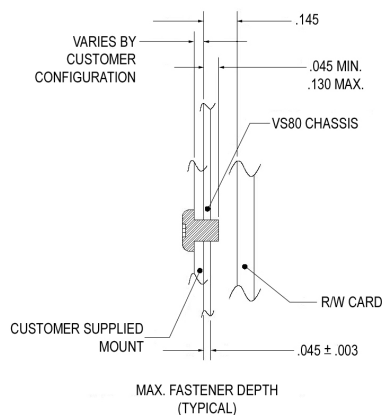


Figure 3-12. Securing the Internal Tape Drive in the Installation Bay

NOTE: Some servers and workstations require mounting rails for internal devices. Contact the manufacturer for specific information, as the mounting rails have varying thicknesses. Consequently, if a different screw is required to mount the tape drive, use the following guidelines.



To complete the installation, follow these steps:

1. Replace the cover on the server or workstation.
2. Attach the power cables to the server or workstation and all attached accessories.
3. Power on the server or workstation and allow its operating system to start.
4. Check your tape drive to make sure it is working properly by following the steps in [“Testing Your Tape Drive.”](#)

3.4 Testing Your Tape Drive

Every time you power on your tape drive, it conducts a power-on self-test (POST). This test ensures that the tape drive is working properly and is ready to use.

While POST is in progress, watch the front panel LEDs to see the progress and results of the test. During POST, the following actions take place:

1. The LEDs illuminate all at once and then turn off.
2. The Ready (green) LED blinks during initialization and remains illuminated after POST.
3. The tape drive emits a buzzing sound as the tape drive calibrates the read/write head’s position. POST is complete only after the buzzing sound stops.

POST takes several seconds to complete, after which the tape drive is ready to use.

NOTE: If POST does not work properly, refer to [“Troubleshooting Your Tape Drive”](#) on page 3-19.

3.5 Troubleshooting Your Tape Drive

This section provides both general troubleshooting guidelines and an LED-specific problem/solution table to help you troubleshoot your tape drive.

3.5.1 *General Troubleshooting Guidelines*

If you have a problem when using the tape drive, first try to isolate the cause of the problem. For example, if you have just installed a new SCSI host bus adapter and the system will not start, the cause of the problem is likely to be the adapter.

When installing multiple items of hardware and software, install each item one at a time, restarting the system each time. Also, if you have installed multiple devices or software and then experience problems, remove or uninstall each in turn to establish which one is causing the problem.

Remember that the system recognizes devices during power on. If you swap or connect a product when the system is running, be sure to restart the system. Restarting the system resets devices and often resolves problems. It is good practice to restart after adding a driver or installing new firmware.

3.5.2 *Troubleshooting the Tape Drive*

Table 3-2 on page 3-20 provides troubleshooting information on errors indicated by front panel LEDs, including the following topics:

- [None of the tape drive's LEDs illuminate.](#)
- [All of the LEDs on the front panel blink continually.](#)
- [The host server or workstation does not recognize the tape drive.](#)
- [There are fatal or non-fatal errors for which you cannot find the cause.](#)

If the LEDs on the front panel act differently than described in “Testing Your Tape Drive” on page 3-18, the tape drive is not working properly. Table 3-2 helps you troubleshoot problems with the tape drive:

Table 3-2. Understanding Errors Indicated by Front Panel LEDs

Symptom	Problem	Solution
None of the tape drive’s LEDs illuminate.	The tape drive is not receiving power.	Check the tape drive’s power cable. If you have a tabletop tape drive, check the power cable connections. Plug the power cable into a different power outlet.
All of the LEDs on the front panel blink continually.	An internal tape drive fault has occurred.	<ul style="list-style-type: none"> • Reset the tape drive by holding the Unload button down for six seconds or until all three LEDs are illuminated. Release the Unload button when the reset process begins. • Power the tape drive off and then on again. If it is an internal tape drive, shut down and power off the host server or workstation, then power it back on and allow it to go through its initialize process. • Call technical support if POST continues to fail.
The host server or workstation does not recognize the tape drive.	The tape drive’s SCSI ID might not be unique.	Change the tape drive’s SCSI ID: <ol style="list-style-type: none"> 1. Shut down and power off the host server or workstation. 2. Power off the tape drive. 3. Change the tape drive’s SCSI ID. Refer to pages page 3-4 and page 3-11 for information on selecting the proper SCSI ID. 4. Power on the tape drive. 5. Power on the host server or workstation. Ensure that all devices on the SCSI bus are LVD or SE.
	The SCSI host bus adapter might be incorrectly configured.	Check the SCSI host bus adapter configuration. Refer to the SCSI host bus adapter manuals for instructions.
	The SCSI cable might be loose.	Check both ends of the SCSI cable, for both the tabletop and internal tape drives.
	The SCSI terminator might be loose or missing.	<ul style="list-style-type: none"> • Tabletop tape drive: make sure the terminator is properly seated on the open SCSI connector on the rear panel of the tape drive or on the last device on the SCSI bus. • Internal tape drive: make sure an LVD/SE terminator is in place on the end of the SCSI cable for the tape drive.

Table 3-2. Understanding Errors Indicated by Front Panel LEDs (*Continued*)

Symptom	Problem	Solution
The host server or workstation does not recognize the tape drive. (<i>continued...</i>)	The SCSI bus might be improperly terminated.	<ul style="list-style-type: none"> • If your tape drive is the last or only device on the SCSI bus, make sure the tape drive is properly terminated. • If the tape drive is not the last or only device on the SCSI bus, check all of the SCSI cable connections and make sure the last device on each end of the SCSI bus is terminated and powered on. <p>Note: The SCSI host bus adapter must usually be terminated.</p>
	The SCSI terminator might not be at the end of the SCSI bus or more than two terminators might be present on the SCSI bus.	Make sure the terminators are placed only at each end of the SCSI bus—one at the host bus adapter and one on the last device on the bus, for both the internal and tabletop tape drives.
	The SCSI host bus adapter might be in a defective expansion slot.	Move the SCSI host bus adapter to a different expansion slot.
	The SCSI bus might be too long.	<p>Make sure the total length of the SCSI bus does not exceed these ANSI SCSI standards:</p> <ul style="list-style-type: none"> • 19 feet (6 meters) for an SE bus • 40 feet (12 meters) for an LVD SCSI bus with multiple devices • 82 feet (25 meters) for an LVD SCSI bus with a single device • 10 feet (3 meters) for a Fast SCSI-2 or Ultra SCSI-1 bus.
There are fatal or non-fatal errors for which you cannot find the cause.	The SCSI bus might be improperly terminated.	<ul style="list-style-type: none"> • If the tape drive is the last or only device on the SCSI bus, make sure the tape drive is properly terminated. Make sure only the last device is terminated. • If the tape drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated and powered on.
	The AC power source may not be properly grounded (tabletop tape drive only).	<ul style="list-style-type: none"> • Plug the tabletop tape drive's power cable into a power outlet on the same circuit as the host server or workstation. • Plug the tabletop tape drive's power cable into a different power outlet.

Notes



CHAPTER 4 DLT VS80 Use

This chapter explains how to use your DLT VS80 tape drive. It describes the front panel LEDs and controls, how to load and eject DLTtape IV data cartridges, how to use and care for DLTtape IV data cartridges, and how to use the cleaning cartridge.

NOTE: For current information on operating system, application, and tape driver compatibility, visit: www.quantum.com

4.1 Front Panel Controls and Indicators

This section explains what the front-panel controls and indicators are, and how they are used. See [Figure 4-1](#).

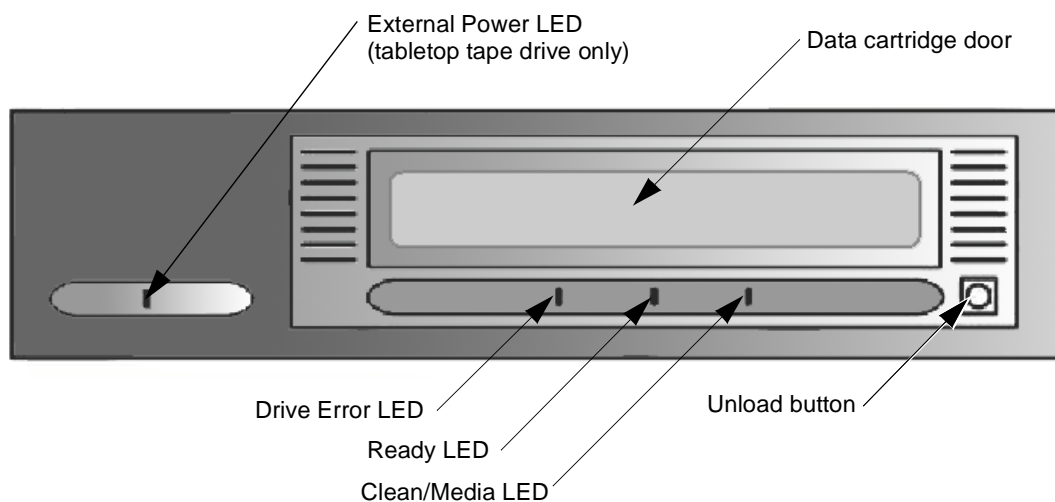


Figure 4-1. Tabletop Tape Drive Front Panel Layout

4.1.1 *Indicator Activity During Power-On Self-Test (POST)*

Every time you power on your tape drive, it conducts a power-on self-test (POST). This test ensures that your tape drive is working properly and is ready to use. While POST is in progress, watch the front panel LEDs.

1. The LEDs illuminate all at once and then turn off.
2. The Ready (green) LED blinks during initialization and remains illuminated after POST.
3. The tape drive emits a buzzing sound as it calibrates the read/write head's position. POST is complete only after the buzzing sound stops.

POST takes several seconds to complete, after which the tape drive is ready to use.

4.1.2 *Indicator Activity During Tape Drive Operation*

When your tape drive is in use, a variety of indicator LEDs can blink or be illuminated. [Table 4-1](#) describes the circumstances under which one or more indicators are illuminated or blinking immediately after POST.

Table 4-1. Tape Drive Status and Indicator Activity

Tape Drive Status	Indicator Activity
Power to the tape drive	The Ready LED is on
No power to the tape drive	The Ready LED is off
The tape drive detected an unrecoverable hard error condition	The Drive Error LED is on
The tape drive detected a recoverable read/write error	The Clean/Media LED blinks

Table 4-2 describes what each front panel indicator means.

Table 4-2. Indicator Activity

Indicator	State	Operating Condition
Drive Error (amber)	Blinking	An unrecoverable tape drive error or a POST error has occurred—call Technical Support.
	Off	No tape drive Errors.
Ready (green)	On	Power to the tape drive.
	Off	No power to the tape drive.
	Blinking (constant period & duty cycle)	Tape is in motion.
	Blinking (dual period & duty cycle)	Reserved.
Clean /Media (amber)	Blinking	A hard read/write error that is probably recoverable has occurred. Clean the tape drive. The LED is off after completing a cleaning cycle with a DLT1 cleaning cartridge or after loading a properly formatted data cartridge into the tape drive. Cycling the power to the tape drive also turns off the LED.
	Off	Cleaning is not required.
All three LEDs	On	POST is starting.
	Blinking	Firmware upgrade is in progress.
External Power LED	On	Power to the tape drive.
	Off	No power to the tape drive.

NOTE: Refer to [Table 3-2, “Understanding Errors Indicated by Front Panel LEDs”](#) on page 3-20 for help troubleshooting your tape drive.

4.2 Data Cartridge Use and Care

Your tape drive uses only DLTtape IV data cartridges. Your tape drive can read—but not write to—DLTtape IV data cartridges previously written in the DLT 4000 format.

NOTE: Your tape drive automatically unloads any other data cartridge types and any data cartridges whose format it cannot read. Make sure all data cartridges that you use for writing are either unformatted or have been used with your tape drive before loading them.

4.2.1 Loading a Data Cartridge

After the tape drive completes POST, insert the DLTtape IV data cartridge into the data cartridge slot, oriented as shown in the [Figure 4-2](#), and push the data cartridge gently into the tape drive until it stops.

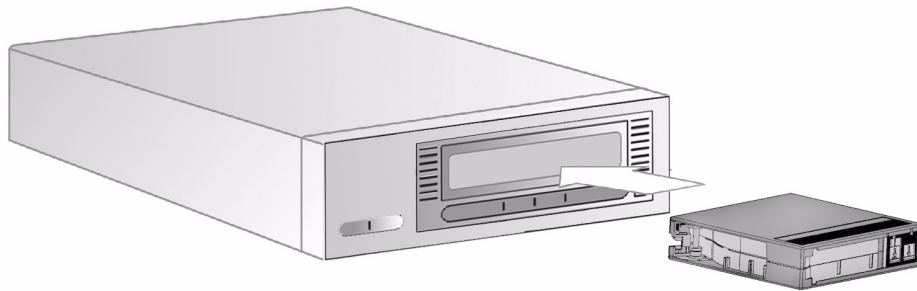


Figure 4-2. Loading a DLTtape IV Data Cartridge

4.2.2 Unloading a Data Cartridge

CAUTION Remove the data cartridge from your tape drive before powering off the tabletop tape drive or the host server or workstation for an internal tape drive. Leaving a data cartridge in the tape drive when power is off can result in data cartridge and tape drive damage and may cause data loss because the header/catalog data may not be properly written before the tape drive loses power.

To unload a data cartridge from your tape drive, follow these steps:

1. Press the Unload button or use your backup software to unload the data cartridge. The Ready LED blinks while the tape drive rewinds the tape. When the tape drive has rewound the tape, it unloads the data cartridge.
2. Gently remove the data cartridge from the tape drive by pulling it directly out as shown in [Figure 4-3](#).

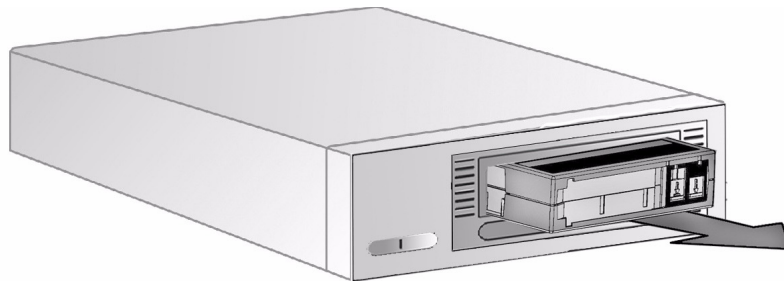


Figure 4-3. Unloading a DLTape IV Data Cartridge

3. Return the data cartridge to its storage case to prolong data cartridge life.

4.2.3 Write-Protecting Data Cartridges

All DLTape IV data cartridges have a write-protect switch to prevent accidental erasure of data. Before loading a DLTape IV data cartridge into your tape drive, make sure the write-protect switch on the front of the data cartridge is in the position you need.

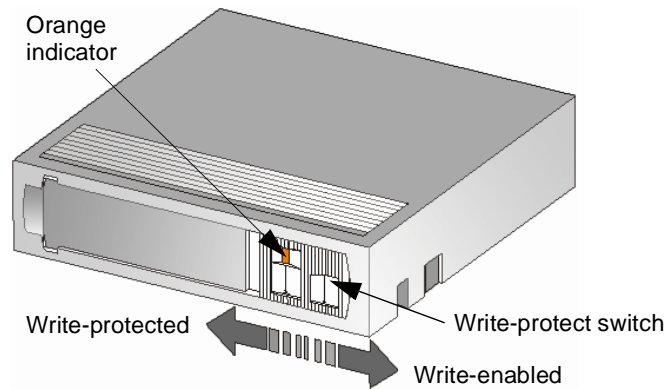


Figure 4-4. Data Cartridge Write-Protect Switch

Slide the switch **to the left** to write-protect the data cartridge. A small orange rectangle is visible, indicating that the data cartridge is write-protected.

Slide the switch **to the right** to allow your tape drive to write data to the data cartridge.

4.2.4 *Caring for Your Data Cartridges*

To ensure the longest possible life for all of your DLTtape IV data cartridges, follow these guidelines:

- Do not drop or strike a data cartridge. Excessive shock can displace the tape leader, making the data cartridge unusable and possibly damaging your tape drive.
- Store your DLTtape IV data cartridges in their storage cases.
- Do not expose your DLTtape IV data cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- The operating temperature range for your DLTtape IV data cartridges is 50 °F to 104 °F (10 °C to 40 °C). The storage temperature range is 60 °F to 90 °F (16 °C to 32 °C). Always store your DLTtape IV data cartridges in their storage cases.
- If a DLTtape IV data cartridge has been exposed to temperatures outside the ranges specified above, stabilize the data cartridge at room temperature for the same amount of time it was exposed to extreme temperatures, up to 24 hours.
- Store your DLTtape IV data cartridges in a dust-free environment in which relative humidity is always between 20% and 80% (noncondensing). The ideal storage relative humidity is 40%, ±20%.
- Do not place DLTtape IV data cartridges near sources of electromagnetic energy or strong magnetic fields, such as computer monitors, electric motors, speakers, or X-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data on data cartridges.
- Place identification labels only in the slide-in slot on the front of the data cartridge.
- Never use any type of adhesive labels on your DLTtape IV data cartridges.

4.2.5 Using the Cleaning Cartridge

When the Clean/Media LED is illuminated, your tape drive's read/write head may need to be cleaned.

Follow the instructions on [page 4-4](#) to load the cleaning cartridge. Cleaning typically takes several minutes, during which the Ready LED blinks.

CAUTION Use only Quantum-approved cleaning cartridges in your tape drive. Use of any other type of cleaning cartridge can damage the read/write head in your tape drive. If you load any other type of cleaning cartridge or method, your tape drive unloads it within approximately 25 seconds. The part number for the Quantum cleaning cartridge is BHXHC-02.

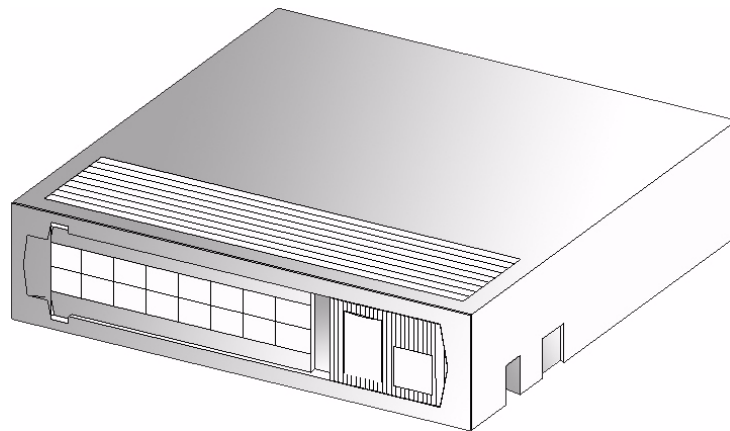


Figure 4-5. DLT Cleaning Cartridge

Each cleaning cartridge has a useful life of 20 cleanings. The cleaning cartridge includes a label with 20 small boxes printed on it. Always place a check mark in a box each time you use the cleaning cartridge to clean the tape drive. Replace the cleaning cartridge when you have checked all the boxes.

When the cleaning cartridge has cleaned the read/write head, the Clean/Media LED turns off and the tape drive ejects the cleaning cartridge.

NOTE: If any LEDs blink or if the Clean/Media LED is illuminated when you insert another data cartridge immediately after cleaning, see [Table 4-2 on page 4-3](#) for more information.



This chapter explains how to update your tape drive's firmware from a DLTtape IV data cartridge or from a file on the host server or workstation.

5.1 Updating Tape Drive Firmware—Overview

The DLT VS80 automatically updates the tape drive's firmware directly from a DLTtape IV data cartridge containing the appropriate information. The tape drive also updates the tape drive's firmware from the host server or workstation. See the WRITE BUFFER command in the *DLT1/VS80 SCSI Interface Guide*.

CAUTION During a firmware update, take reasonable precautions to prevent a power failure. During the firmware update process, when the new firmware is actually being programmed into the Flash EEPROM, a power failure—but not a Bus Reset—causes the tape drive's controller module to become unstable.

5.2 Creating a Firmware Update Data Cartridge

To perform the firmware update, you need a DLTtape IV data cartridge and a copy of the firmware image. This image must be byte-written without compression onto the media. You must copy the firmware image to the media instead of using a backup utility to transfer it to the tape.

NOTE: UNIX Systems: You can use the FTP utility to transfer the binary image file onto the UNIX system. Be sure to specify “type image” before performing the *get* or *put* operation. Doing so prevents extra characters from being added to the image file, which would make the image file invalid. The image file must be exactly 1286*512 Bytes in size. The data must also be uncompressed.

5.3 Updating the Firmware

To update the tape drive’s firmware, follow the steps in this section.

CAUTION Never power off the tape drive or the host server or workstation during the firmware update process. Doing so can damage the tape drive’s controller hardware.

5.3.1 Updating the Firmware

NOTE: Read these instructions completely before proceeding. All timing indications are approximate.

1. If there is a DLT data cartridge currently in the tape drive, remove it before proceeding.
2. If possible, power cycle (turn the tape drive’s power off, then back on) and allow POST to complete successfully. The tape drive will emit a buzzing sound as the head drives toward its starting point (after 18 seconds). POST will complete after 20 seconds. When POST is complete and no data cartridge is inserted, only the Ready (green) LED is illuminated.

3. Press and hold the **Unload** button on the tape drive's front panel until the LEDs are no longer illuminated (approximately 12 seconds), then release the **Unload** button. The Ready LED flashes.
4. **Within four seconds**, press and release the **Unload** button again. All LEDs should blink, indicating that the tape drive is in firmware upgrade mode.

CAUTION While the tape drive is in firmware upgrade mode, **DO NOT POWER OFF THE TAPE DRIVE**, or the host server/workstation (if connected), until the firmware upgrade process is complete. You can damage the tape drive's controller hardware if you power off the tape drive.

5. Insert the Firmware Upgrade Data Cartridge into the tape drive. The tape drive then begins the process of reading the image file from the data cartridge. All LEDs flash or are steadily illuminated during the various phases of the upgrade process, which typically takes about five minutes. If the firmware upgrade process completes successfully, the tape drive automatically ejects the Firmware Upgrade Data Cartridge.
6. Power cycle (off, then on) the tape drive. The tape drive is now ready to use with the new firmware.

Please observe the following conditions:

- You may need to restart your computer for it to recognize the tape drive.
- If the tape drive does not eject the Firmware Upgrade Data Cartridge, the firmware upgrade failed. This may be because the data cartridge was not a valid Firmware Upgrade Data Cartridge. If so, no damage has occurred. Obtain a valid Firmware Upgrade Data Cartridge and repeat the process. See [“Troubleshooting the Firmware Upgrade” on page 5-4](#) for instructions on how to proceed.
- If you press and hold the Unload button for six seconds (LEDs on) and release it before 12 seconds (LEDs off), the tape drive executes a Front Panel Reset and runs POST.
- If you press and hold the Unload button for 12 seconds (LEDs on, then off) and then release it without pressing it again within four seconds, the tape drive reverts to Ready mode, indicated by the Ready (green) LED.

5.3.2 Troubleshooting the Firmware Upgrade

If the firmware upgrade failed, the tape drive does not unload the Firmware Upgrade Data Cartridge at the end of the process. Refer to [Table 5-1](#) for troubleshooting information.

Table 5-1. Firmware Upgrade Troubleshooting

Problem	Indications/Solution
The data cartridge is not a valid Firmware Upgrade Data Cartridge.	<p>Indications: The tape drive does not attempt to update the firmware. The tape drive resets and leaves the data cartridge loaded to indicate that the firmware update did not succeed. No damage to the tape drive or data cartridge results.</p> <p>Solution:</p> <ol style="list-style-type: none"> 1. Eject the data cartridge as described in “Unloading a Data Cartridge” on page 4-5. 2. Make a valid Firmware Upgrade Data Cartridge to solve this problem. 3. Repeat the steps in “Updating the Firmware” on page 5-2.
The data cartridge contains a valid firmware upgrade image file, but the flash EEPROM programming process fails.	<ol style="list-style-type: none"> 1. Eject the Firmware Upgrade Data Cartridge. 2. Power cycle the tape drive (off, then on). 3. Make a new Firmware Upgrade Data Cartridge. 4. Repeat the update process. <p>If the previous steps do not work, the tape drive’s controller hardware is probably damaged and must be replaced. The tape drive resets and runs POST, which fails if the flash EEPROM does not contain a valid firmware image. If this occurs, you must repair the tape drive before using it again.</p> <p>Call Technical Support for repair service.</p>

Quantum.

4001 Discovery Dr., Ste. 1100
Boulder, CO 80303
720.406.5700
May, 2004
001596-01



001596-01 REV A07